Argox FM-201

Integration Manual

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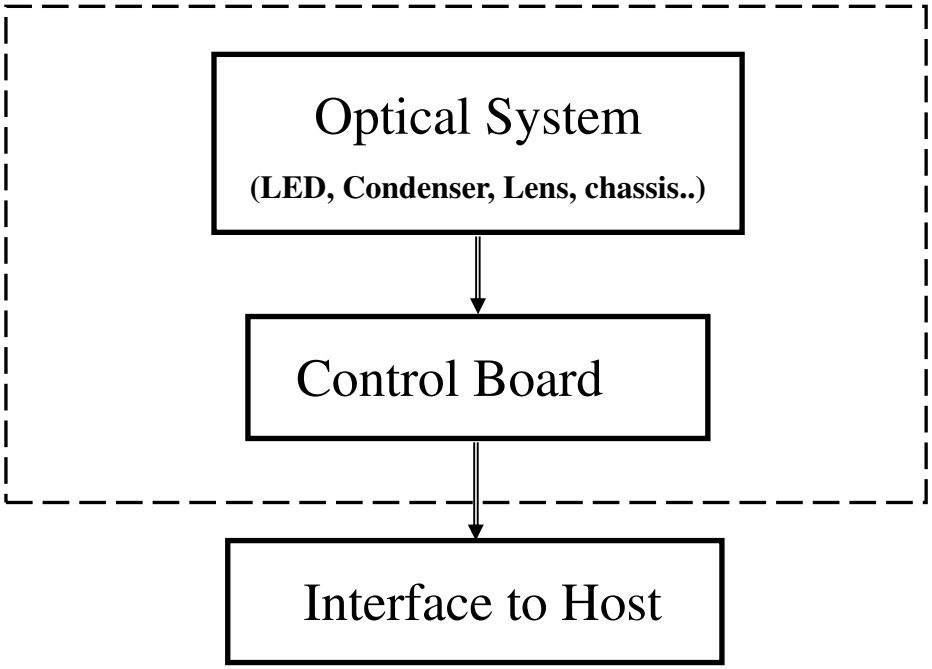
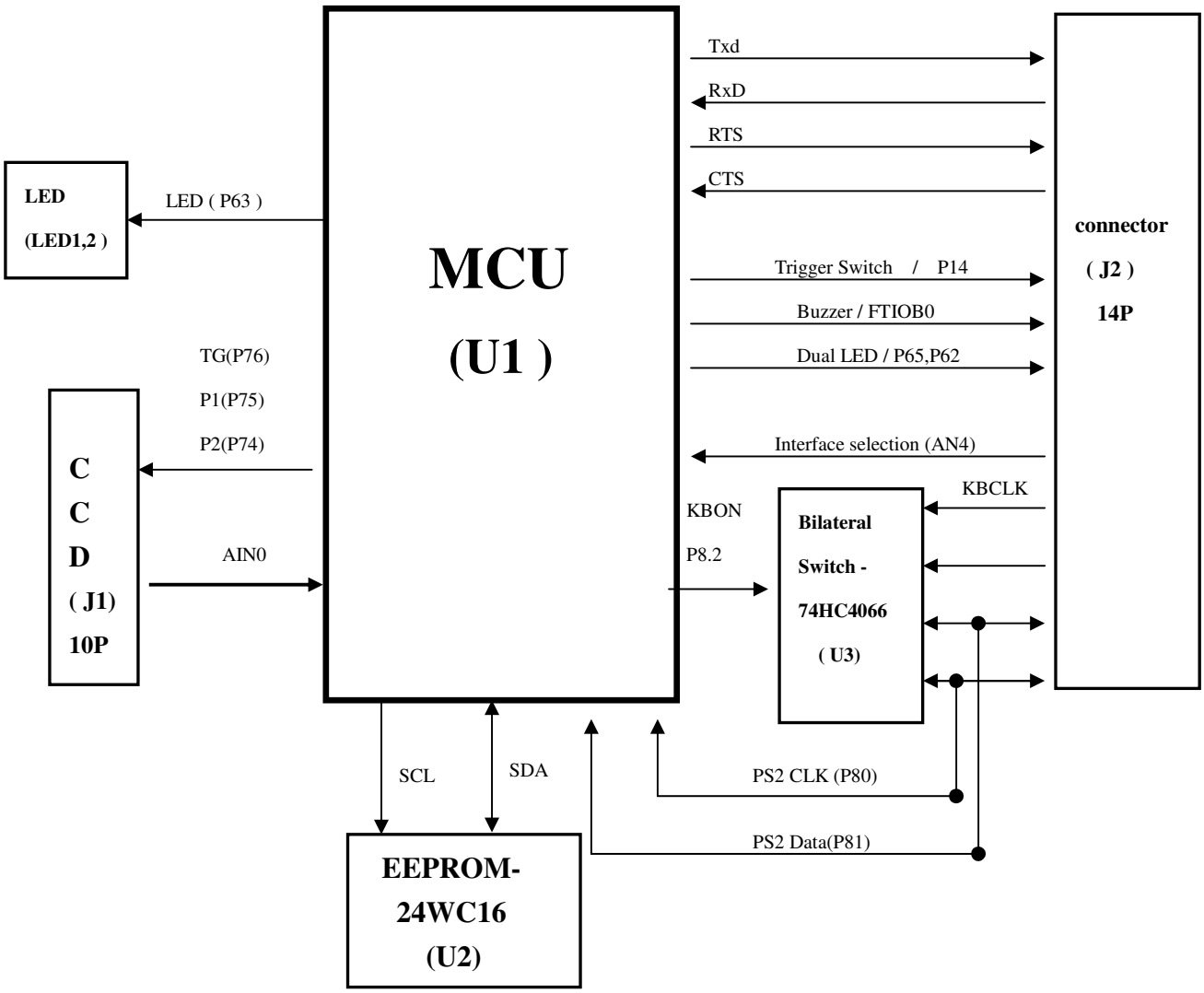
1. About FM-201 Scan Engine

The FM-201 Scan Engine is a small decoder that can read all popular 1D barcodes. This device is comprised of two main parts: an optical system and a control board. The optical system is a 2048 pixel linear imager. The control board contains firmware to scan, decode and output barcode data. The below block diagram shows the data flow from control board to the host.



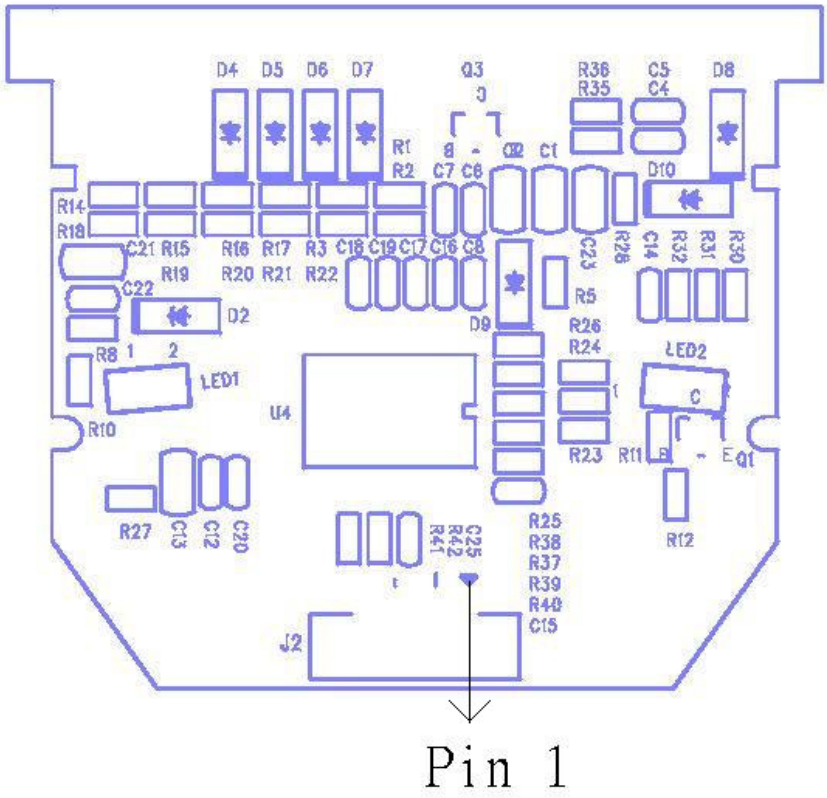
The FM-201 Scan Engine is specifically designed for easy integration into your application devices. The control module supports RS232, Keyboard wedge and USB 1.1 interface.

The control board is based on MCU to fulfill the functions of barcode scanner, image decoding, parameter settings, and communication with host. The block diagram and individual description are listed as below,

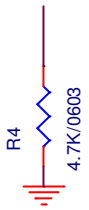
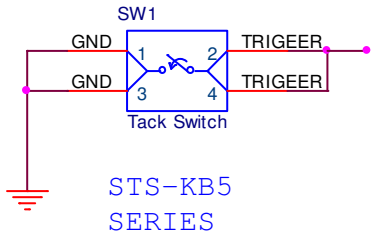


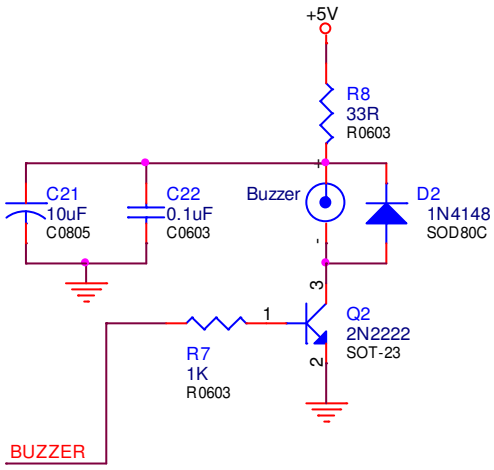
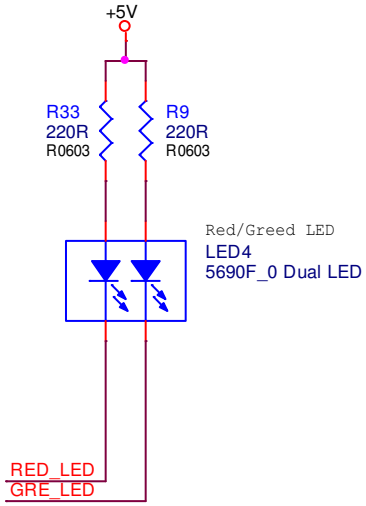
2. Signal Connector

The control module is reserved connection pins for interface, trigger, buzzer, LEDs and power. J2 is comprised of 14 pins that start from right to left, pin1 to pin 14. The diagram and description are listed as below:



2.1. J2 Connector

Pin	Description	Example
1	GND.— Supply signal ground	
2	RTS (To Host) / CLK/KB.— TTL level 232 Request to send	
3	RxD (From Host).— TTL level 232 receive data	
4	CTS (From Host) / DATA/KB.— TTL level 232 Clear to Send signal.	
5	DATA/PC (PS2 DATA).	
6	CLK/PC (PS2 CLK).	
7	TxD (To Host).—TTL level 232 transmit data.	
8	5 V DC input—Supply voltage input.	
9	I/F identification . According to the voltage level at I/F, the scanner will automatically select a communication Interface, when the interface selection of scanner being set at auto-detection mode. The followings list the interface selection corresponding to the various voltage level at I/F. **I/F floating-NC: Identified as RS232** **I/F short to GND: Identified as Keyboard wedge. Wire I/F with a 4.7K then ground : Identified as USB**	**Wire I/F with a 4.7K then ground** 
10	**Trigger Switch(SW1)** To trigger off a scanning operation.. P14 of CPU is wired to the SW1 to read the SW1 status, pressed or released.	

11	**Buzzer** To provide the indication of sound. The generation of frequency & duty (loudness) of buzzer sound is done by Timer Z in CPU	
12	GRE_LED. **Dual LED (LED3)** Dual Red&Green LED for indication.	
13	RED_LED. **Dual LED (LED3)** Dual Red&Green LED for indication.	
14	N.C.	

2.2. Interface Connector

The control board to host interface signals have different definitions depending on the operation of RS232, keyboard wedge or USB.The signals are listed as below:

Pin	Signal	RS232	K/B	USB
1	GND	GND	GND	GND
2	RTS(CLK KB)	RTS	CLK KB	X
3	RxD	RxD	X	X
4	CTS(DATA KB)	CTS	DATA KB	X
5	DATA PC	X	DATA PC	DATA PC
6	CLK PC	X	CLK PC	CLK PC
7	TxD	TxD	X	X
8	Vcc(DC 5V)	Vcc(DC 5V)	Vcc(DC 5V)	Vcc(DC 5V)
9	I/F	I/F	I/F	I/F
10	Trigger	X	X	X
11	Buzzer	X	X	X
12	GRE_LED	X	X	X
13	RED_LED	X	X	X
14	NC	X	X	X

3. Mechanical Specifications

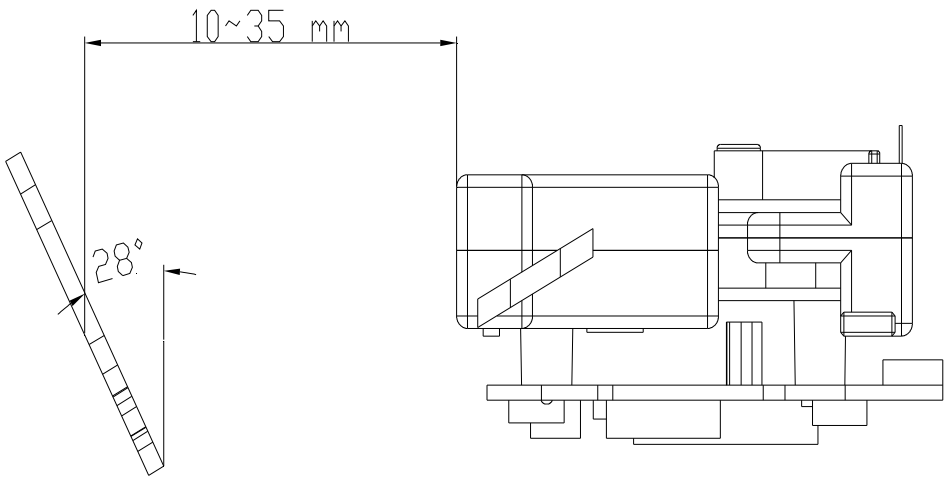
3.1. Distance from window

The window should be mounted close to the front of the Scan Engine. The maximum distance is measured from the Scan Engine housing to the farther surface of the window. The unwanted reflections can occur at either surface and the window thickness can vary, the further side is the worse case.

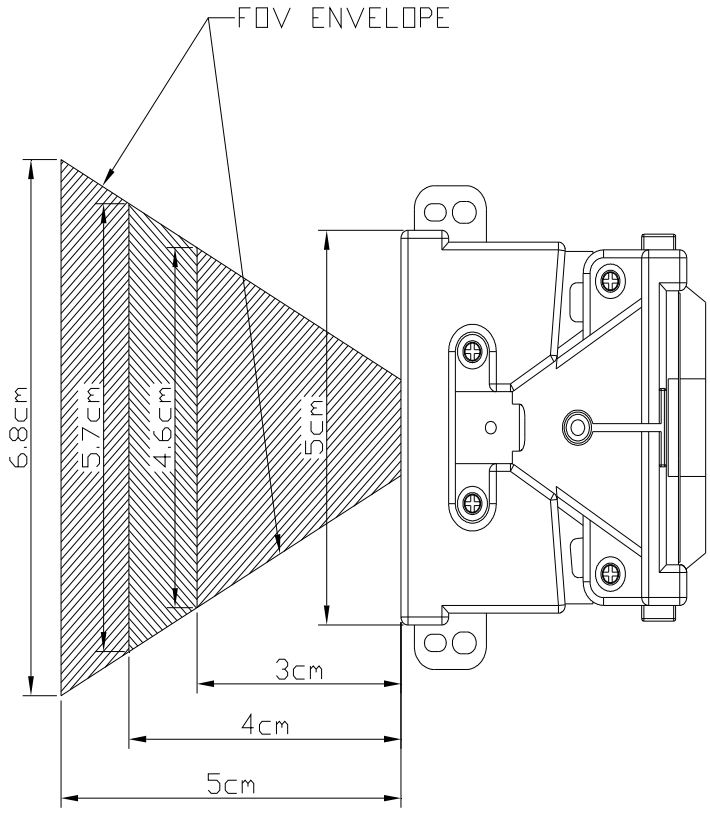
3.2. Window size and material

1. Window material must be clear and anti-scratch. Clarx, Polycarbonate and CR39 are preferred.
2. The recommended thickness of window is from 1mm to 15 mm.
3. The recommended distance is from 10 mm to 35 mm between window and engine.
4. The recommended angle is from 0 to 28 degree .
5. The window size must increase as it is moved away from the engine to the accommodate illumination.

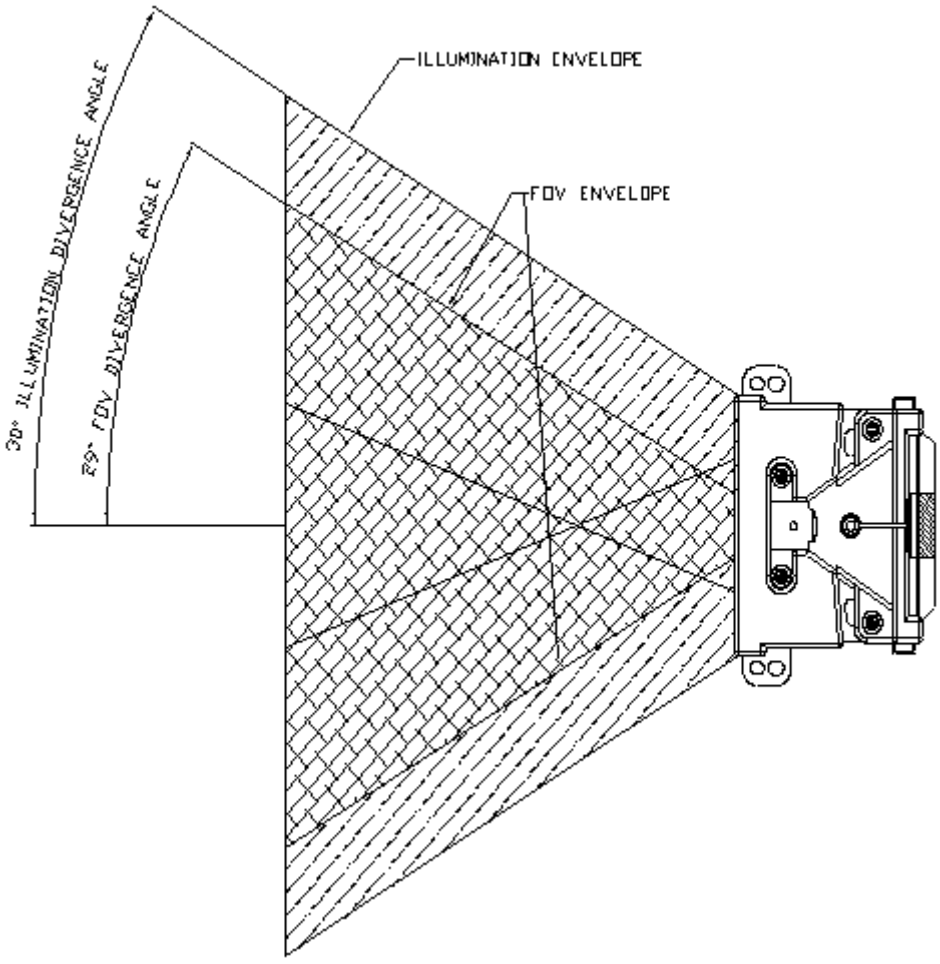
Window Distance and Angle Diagram



Window Size and Distance Diagram

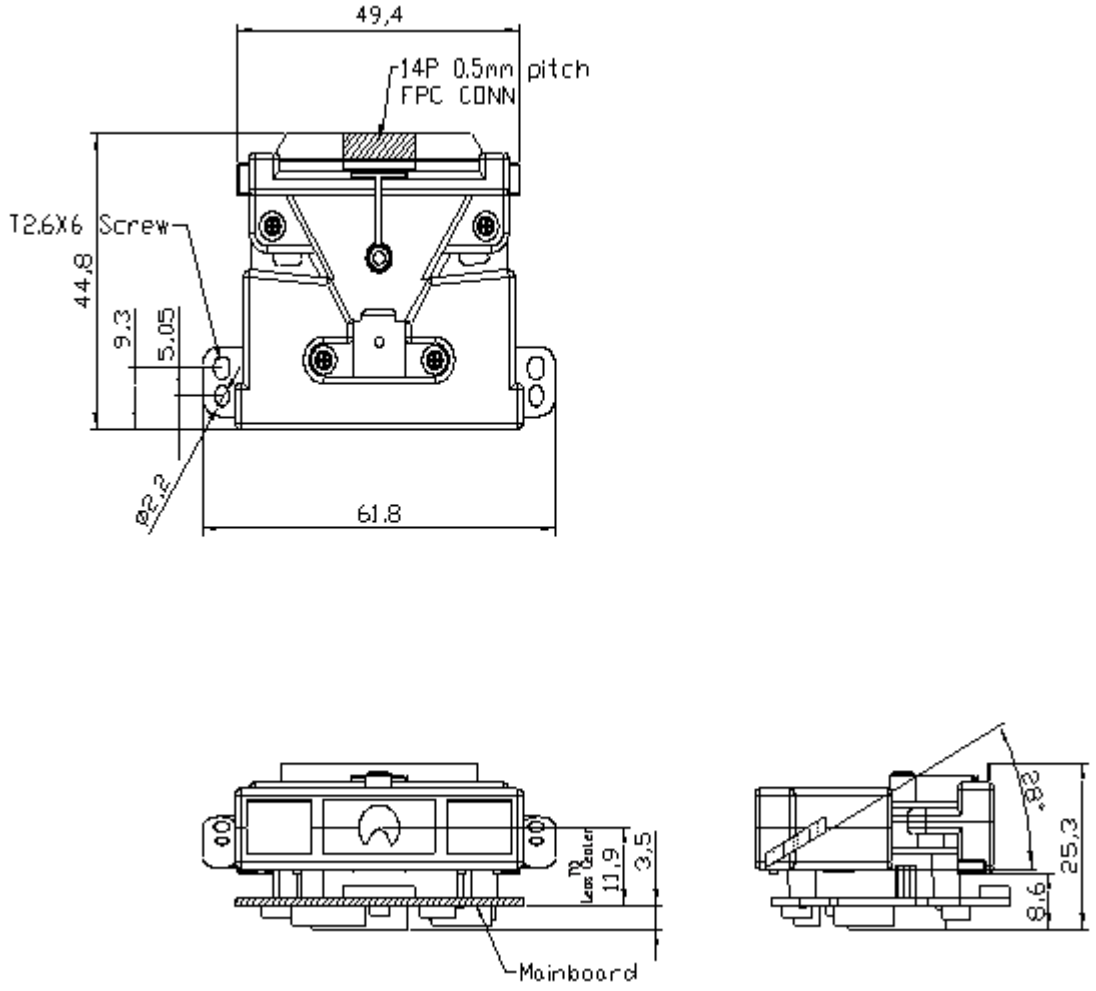


Window Size Diagram (LED Aimer)



FM-201 Engine Bracket Mounting

The illustration below show the mechanical mounting dimensions for the FM-201



4. General Specification

<table>
<tr><td>Item</td><td>Specification</td></tr>
<tr><td>Scanning system</td><td>Red LED light source. 2048 pixels CCD.</td></tr>
<tr><td>Resolution</td><td>4 mil (0.10mm).</td></tr>
<tr><td>Scan angle</td><td>Pitch: <60° (EAN13, 13mil, 35 mm wide , PCS=90%)
Yaw: <70°</td></tr>
<tr><td>Depth of field</td><td>Ambient lux: 300 +/-30 lux (fluorescent lamp).

PCS = 90%.
<table>
<tr><td>Resolution</td><td>Near field</td><td>Far field</td></tr>
<tr><td>4 mil (Code 39, 1:2.5) ,</td><td>45mm</td><td>70mm</td></tr>
<tr><td>5 mil (Code 39, 1:2.5)</td><td>45mm</td><td>80mm</td></tr>
<tr><td>10 mil (Code 39, 1:2.5)43mm</td><td>45 mm</td><td>125mm</td></tr>
<tr><td>13 mil (Code 39, 1:2.5)83mm</td><td>90mm</td><td>155mm</td></tr>
<tr><td>20 mil (Code 39, 1:2.5)95mm</td><td>100mm</td><td>195mm</td></tr>
<tr><td>13 mil (UPC/EAN)</td><td>45 mm</td><td>155mm</td></tr>
</table>
PCS =45%. (Argox Test Chart) < note 1>
<table>
<tr><td>Resolution</td><td>Near field</td><td>Far field</td></tr>
<tr><td>4 mil (Code 39, 1:2.5)</td><td colspan="2">X</td></tr>
<tr><td>5 mil (Code 39, 1:2.5)</td><td>45mm</td><td>60mm</td></tr>
<tr><td>13 mil (Code 39, 1:2.5)</td><td>90mm</td><td>110mm</td></tr>
<tr><td>20 mil (Code 39, 1:2.5)</td><td>105mm</td><td>140mm</td></tr>
<tr><td>13 mil (UPC/EAN)</td><td>45 mm</td><td>115mm</td></tr>
</table>
<table>
<tr><td>Resolution</td><td>Data</td></tr>
<tr><td>4 mil (Code 39, 1:2.5)</td><td>09876</td></tr>
<tr><td>5 mil (Code 39, 1:2.5)</td><td>01234</td></tr>
<tr><td>10 mil (Code 39, 1:2.5)43mm</td><td>ARGOX-123</td></tr>
<tr><td>13 mil (Code 39, 1:2.5)83mm</td><td>83MM CODE-39-1</td></tr>
<tr><td>20 mil (Code 39, 1:2.5)95mm</td><td>95MM -CODE</td></tr>
<tr><td>13 mil (UPC/EAN)</td><td>471987654321</td></tr>
</table></td></tr>
<tr><td>Scan rate</td><td>30~100 sacn/second, auto adaptive.</td></tr>
<tr><td>PCS</td><td>>= 45%</td></tr>
</table>

Reading indication	LED and adjustable beep sound (Add LED&Buzzer yourself)
Symbologies	Code-11, Code-39, Code-93, Code-128, Codabar, EAN-8/13 (with add-on), UPC-A/E UPCE (with add-on). MSI/Plessey ,UK/Plessey, Telepen Industrial 2 of 5, Interleaved 2 of 5, Standard 2 of 5, , Matrix 2 of 5 Eur.China postage. Italian Pharmacy code (code-32). RSS-14, RSS-limited, RSS-expanded.
Power supply	Operating range: 5 VDC +/-0.25 (Scanner only) Power consumption: Scanning: Max.: 250 mA (Test Mode). Typical: Max.: 200 mA (Momentary Mode) Standby: Max.: 60 mA
Environments	Operating temp.: 0~50 °C Storage temp.: -20~+70 °C Ambient LUX.: 0~20000 Lux

5. Test

The illustration below show s a unit similar to the unit tested.